OU7 PASSIVE SEEP INTERCEPTION AND TREATMENT SYSTEM

SAMPLING AND ANALYSIS PLAN

Operations Manager — Date: 8-15-96

Project Manager — Date: 8-13-96

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TABLE OF CONTENTS

1.0 OBJECTIVE

As stated in the Modified Proposed Action Memorandum (PAM) for the Operable Unit 7 (OU7) Passive Seep Interception and Treatment System (March 1996), the overall objective of the accelerated action is to eliminate, to the extent practicable, discharge of F039-listed waste contained in the seep water to a surface water body. This overall objective is accomplished through the interception and treatment of the seep water in an effort to reduce the concentrations of volatile and semivolatile organic compounds.

The OU7 Passive Seep Interception and Treatment System (PSITS) is in fact a passive treatment system, and it is the granular activated carbon (GAC) drum(s) which reduce the concentration of volatile organic compounds (VOCs) and semivolatile organic compounds (SVOCs) in the seep water being discharge to the East Landfill Pond. The system will be monitored quarterly for VOC and SVOC effluent quality, and will be periodically monitored to determine if GAC breakthrough has occurred which would then by followed by GAC drum rotation/change-out (note that GAC drum rotation is only relevant if two drums are being operated in series). During the initial 6 months of operation, samples will be taken on a monthly basis to determine an approximate GAC breakthrough time frame.

In accordance with the overall objective of the accelerated action, this SAP identifies the specific analytical needs, sampling requirements, data handling requirements, and associated quality assurance/quality control (QA/QC) requirements for the following sampling locations:

- Treatment system effluent will be sampled quarterly for VOCs and SVOCs. This effluent data will be compared to the OU7 PSITS Performance Objectives (refer to Appendix A) Note that if only one GAC

drum is in use, the VOC sample taken for the quarterly sample can also be used as the monthly GAC breakthrough assessment sample.

- GAC effluent, effluent from either the sole GAC or the lead GAC as appropriate, will be sampled monthly for VOCs for the first six months to determine an approximate time frame for GAC breakthrough. As data from the initial months of sampling is received it may be necessary to adjust the GAC breakthrough assessment sampling frequency.

Note that if it is necessary to ship samples off-site for analysis, radiological screen samples must also be collected, analyzed, and the data assessed prior to shipment of the samples (refer to Section 4.4).

This SAP does not address sampling of the influent to the interception and treatment system because historical seep characterization data exists. Also, this SAP does not address the sampling of filter socks, spent GAC, or settled solids which may eventually need to be removed from the concrete settling basin. These waste streams will be properly packaged and temporarily stored on-site, and sampling will occur as necessary after a decision is made concerning the final disposition of the waste.

2.0 PASSIVE SEEP INTERCEPTION AND TREATMENT SYSTEM OVERVIEW

The OU7 Passive Seep Interception and Treatment System (PSITS) is designed to collect and treat OU7 seep water and thereby eliminate, to the extent practicable, the discharge of the F039-listed waste contained in this seep water to the East Landfill Pond. The collection and treatment system is comprised of the following items:

- a seep intercept system
- a settling basin to remove total suspended solids (with a resultant decrease in heavy metals concentration).
- a biocide addition system
- a bag filtration system consisting of two filters operated in parallel to remove residual total suspended solids. Currently the system is operating with 25 micron bags.
- one or two 55-gallon drums of granular activated carbon (GAC) to remove VOCs and SVOCs. When two GAC drums are in use, the drums are operated in series in lead and lag positions.

The OU7 seep water is collected by the seep interception system which consists of perforated pipe laid in a gravel bed. The perforated pipe directs the seep water into a pre-cast concrete basin which acts as a settling and head equalizing basin. It is not expected that the sediment collected in this settling basin will require removal during the life of this collection and treatment system. The settling basin has also been equipped with a by-pass line which allows the influent (or a portion of the influent) to by-pass the treatment system during routine maintenance or when the flow rate of the seep water is greater than the maximum system design flow rate.

A pipe discharges from the settling basin to the two bag filters. The bag filters are operated in parallel, with both filters normally in use. The bag filters remove particles greater than 10 or 25 microns (depending upon the micron size of the bag filters being used) from the influent stream, and are located in a below-ground carbon steel tank. After bag filtration the seep water flows through either one or two 55-gallon drums of GAC for the removal of VOCs and SVOCs. The GAC drums are also located in the below-ground carbon steel tank. When two GAC drums are in use, the drums are operated in series in lead and lag positions, and when breakthrough occurs from the lead GAC drum, the lag GAC drum will be moved into the lead position and a new GAC drum will be placed in the lag position. GAC effluent is gravity-discharged to the East Landfill Pond.

3.0 SAMPLING APPROACH AND REQUIREMENTS

This section addresses sampling locations, frequency, specific analytical needs, sampling requirements, and associated quality assurance/quality control (QA/QC) requirements. Data collection follows requirements outlined in the Rocky Mountain Remediation Services, L.L.C. Quality Assurance Program Plan (QAPP), 95-QAPP-001, Rev. 0, 10/05/95.

3.1 SAMPLING LOCATIONS AND FREQUENCY

The historic Rocky Flats Environmental Data System (RFEDS) location code for the OU7 landfill seep is SW097. Because of the installation of the PSITS, new RFEDs location codes have been assigned to define the data associated with the new sample points as follows:

- Treatment System Effluent: The RFEDS location code is SW00196
  - This sample point is located at the discharge pipe which daylights east of the below-ground carbon steel tank.
  - This sample point reflects the quality of the treated water being gravity discharged to the East Pond Landfill.
  - Note that when only one GAC drum is in use, this location code will also be used for the GAC breakthrough assessment sample (as discussed below), and that during the month that the quarterly sample is taken it is not necessary to take an additional VOC breakthrough assessment sample. Instead the VOC sample taken for the quarterly sample will also be used as the monthly GAC breakthrough assessment sample.
  - Note that the characteristics of the treated effluent will be different from the historic data associated with the untreated SW097 sampling point.

- GAC Breakthrough Assessment: The RFEDS location code is SW00296
  - This RFEDS location code will only be used when two GACs are being operated in series.
  - Effluent from the lead GAC will be sampled monthly for VOCs for the first six months to determine an approximate time frame for GAC breakthrough. As data from the initial months of sampling is received it may be necessary to adjust the breakthrough assessment sampling frequency.
  - After the initial six months of sampling, the frequency of subsequent GAC breakthrough assessment sampling will be determined based on an assessment of the initial months of data.
  - Data collected from this sample location will be utilized to determine when GAC breakthrough occurs, and the subsequent timing of drum change-out/rotation.

A sampling summary is contained in Table 3-1, and a description of the sampling procedures is contained in Section 4.0. Note that sample locations, sample frequencies, and requested analytical suites may be increased at any time at the request of the Project Manager.

3.2 ANALYTICAL METHODS

Table 3-1 also summarizes the sampling location, sampling frequencies, analytical suites, and analytical methods to be monitored during PSITS operations. EPA's CLP protocols are considered Level IV analytical methods. Other analytical methods are described in Test Methods for the Evaluation of Solid Waste, EPA SW-846, (EPA 1990),Methods for the Determination of Organic Compounds in Drinking Water, (EPA 1988),

TABLE 3-1

Sampling Summary for Passive Seep Interception and Treatment System

RFEDS Sample Location Code[1]	Sample Location Description	Sample Type	Sampling Frequency[2]	Analytical Suites[2, 3]	Analytical Methods and Protocol Used
SW00196	Treatment System Effluent - discharge pipe exiting the carbon steel tank.	Aqueous	One grab sample quarterly Note that when only one GAC drum is in use the quarterly VOC sample can also be used as the monthly breakthrough assessment sample.	VOCs; SVOCs	VOCs CLP Low Level SOW/8260; SVOCs CLP/8270
SW00296	GAC Breakthrough Assessment -	Aqueous	One grab sample monthly for the first 6 months, subsequent sampling frequency will be determined based on an assessment of the initial 6 months of data.	VOCs	VOCs CLP Low Level SOW/8260

1. Sample locations may be added at any time at the request of the Project Manager.
2. Sampling frequency and analytical suites may be increased at any time at the request of the Project Manager
3. Note that if it is necessary to ship the samples off-site for analysis, radiological screen samples must also be collected, analyzed, and the data assessed prior to shipment of the samples (refer to Section 4.4).

Standard Methods for the Examination of Water and Wastewater, and Methods for Chemical Analysis of Water and Wastes. Radionuclides are analyzed by methods developed by or reviewed and approved by the EPA.The methods proposed for sample analysis are those recommended by the EPA and are deemed consistent with the data quality objectives (DQOs). In addition, the Rocky Flats General Radiochemistry and Routine Analytical Services Protocol (GRRASP) analytical specific QA/QC requirements will be used.

The analytical accuracy and precision goals are presented in the respective methods. These criteria include surrogate recoveries, matrix spike recoveries, matrix spike duplicate or laboratory duplicate precision, calibration linearity, laboratory control sample analyses, etc. Refer to the CLP protocols, the analytical methods, and the GRRASP for an exact description of the QA/QC measures and acceptance ranges for each method.

3.3 BOTTLE AND PRESERVATION REQUIREMENTS

Table 3-2 shows the bottle and preservation requirements for the aqueous samples.

3.4 FIELD QUALITY CONTROL

Field QC samples will be included to assure the accuracy and precision of the sampling procedures. Field sampling quality control will consist of the following (refer to Section 5.2 for a full discussion):

- Collection of field duplicate samples will be at a minimum of 1 per 20 samples;
- Collection of sampling equipment rinsate blanks at a minimum of 1 per 20 samples (as appropriate);
- Collection of a trip blank (volatile organic compounds only) once a year for the quarterly sampling.

TABLE 3-2

Bottle and Preservation Requirements for Water Analysis

Analysis[a,b]	Bottle	Preservative[c]	Maximum Holding Time
Radiological Screen	100 or 125 ml/poly	HNO_3	-
VOC	2 X 40 ml/amb. glass	4°C/HCl 4 drops	14 days
SVOC	1 Liter/ amb. glass	4°C	7 day extr./40 day analysis

[a] Due to time constraints during sampling, the samples will be placed in a cooler with blue ice (if required) and transferred to the laboratory or sample refrigerator as soon as possible to chill the samples to 4°C±2°C. It is recognized that the cooler and samples will not achieve 4°C±2°C in the field. Because monitoring of the cooler/sample field temperature requires that the cooler be opened multiple times, which would result in a rise in the internal cooler temperature, the field temperature of the cooler/samples will not be monitored. Radiological samples do not require refrigeration but must be secured in a cool, dry area to minimize the chance of cross-contamination.

[b] Sample bottles may be bagged in the field, in the subcontractor trailer, or delivered to the on-site laboratory without bags. The sampler/packer shall use best judgement when packing samples, and delivery of samples to the on-site lab will not require the stringent packing requirements applicable to off-site shipments.

[c] All non-volatile samples preserved with acid must be checked for pH; they must be below pH 2 for proper preservation.

4.0 SAMPLING PROCEDURES

This section discusses the methods for collecting, management, screening, packaging, and shipping PSITS samples.

4.1 SAMPLE COLLECTION

The treatment system effluent sample (and if only one drum is in use the GAC breakthrough assessment sample) will be collected from the discharge pipe which daylights east of the below-ground carbon steel tank. Purge time is not applicable to the effluent discharge pipe because this is simply an outfall and does not contain a sample port.

When two GAC drums are being operated in series, the effluent sample from the lead GAC will be collected from the hand sample port with attached tubing located between the lead and lag GAC drums. The purge time for the effluent sample collected from lead GAC will be 30 seconds.

The field data collected on the treatment system effluent and GAC effluent liquid samples will include pH, conductivity, and temperature. The temperature will be monitored using either a red-liquid or mercury thermometer. Neither residual chlorine checks nor tap preparation for bacteriological samples is required for any of the samples collected at the PSITS. It is not necessary to follow a particular bottle order when collecting the samples.

When collecting water samples, do not touch the water as it enters the bottle and do not touch the inside of the bottle or cap. If either of these occur, discard the bottle, obtain a new one and collect a new sample. Purge water drained from the treatment system during sampling will be returned to the head of the seep collection/treatment system or processed at the Consolidated Water Treatment Facility (CWTF). Plastic sheeting used during sampling will be disposed of as specified in the Waste Stream and Residue Identification and Characterization (WSRIC) - Operable Unit Operations, Version 5.0, November 18, 1993. Spills will be collected and handled in accordance with Section 4 of the Hazardous Waste Requirements Manual (EG&G, 1994). Personal Protective Equipment will be removed and handled as outlined in 5-21000-OPS-FO.06, Handling of Personal Protective Equipment, and Section 4.6 of this document, Personal Protective Equipment. All procedures shall be in accordance with the CWTF Health and Safety Plan (RF/ER-96-0018).

Due to time constraints during sampling, the samples will be placed in a cooler with blue ice (if required) and transferred to the laboratory or sample refrigerator as soon as possible to chill the samples to 4°C±2°C. It is recognized that the cooler and samples may not achieve 4°C±2°C in the field. Because monitoring of the cooler/sample field temperature requires that the cooler be opened multiple times, which would result in a rise in the internal cooler temperature, the field temperature of the cooler/samples will not be monitored. Radiological samples do not require refrigeration but must be secured in a cool, dry area to minimize the chance of cross-contamination.

4.2 SAMPLE CUSTODY

The chain of custody for sampling shall be filled out in accordance with 5-21000-OPS-FO.13, Containerization, Preserving, Handling, and Shipping of Soil and Water Samples, and 4-B29-WR-OPS-FO.14, Field Data Management. Custody seals shall be placed on the sample containers after the samples are collected and prior to being relinquished from the sampler. The names of the samplers must be printed on the form. The samples will be kept under custody until both the COC and samples are relinquished for shipping. The COC will be signed when samples are relinquished for analysis.

4.3 SAMPLE EQUIPMENT DECONTAMINATION

Equipment used at more than one location for collection of PSITS samples shall be decontaminated between sampling locations in accordance with 5-21000-OPS-FO.03, General Equipment Decontamination. Water used for equipment decontamination will be returned to the head of the PSITS or processed at the CWTF.

4.4 RADIOLOGICAL SCREENING OF SAMPLES

The radiological screening of samples in preparation for off-site shipment will comply with 5-21000-OPS-FO.18, Environmental Sample Radioactivity Content Screening. Environmental samples are considered non-radioactive (DOT Category I) if sample screening indicates a total activity less than 2,000 pCi/g for solids, or less than 2,000 pCi/mL for waters and have a gross alpha activity of <10,000 pCi/sample and gross beta activity of <100,000 pCi/sample.

In the event that samples are above 2,000 pCi/g (solids) or 2,000 pCi/mL (aqueous) for radioactivity, 4-B11-ER-OPS-FO.25, Shipment of Radioactive Materials Samples, will be used for sample shipment.

4.5 SAMPLE STORAGE, PACKAGING AND SHIPPING

When sampling is complete (refer to Section 4.1 for sample collection details), the samples must be properly packaged and stored until they are shipped in accordance with 5-21000-OPS-FO.13, Containerization, Preserving, Handling, and Shipping of Soil and Water Samples as applicable. The sampler/packer shall use best judgement when packing samples, and delivery of samples to the on-site lab will not require the stringent packing requirements applicable to off-site shipments. If samples are to be shipped off-site, the samples will be stored until results are received from the Radiological Screen sample (refer to Section 4.4 of this document). General chemistry samples must be stored in plastic bags and refrigerated at 4°C±2°C until shipped. Radiological samples do not require refrigeration but must be secured in a cool, dry area to minimize the chance of cross-contamination.

Samples which are collected and stored prior to shipment will be placed in the field refrigerator for refrigeration to 4°C±2°C. When in use the temperature of the field refrigerator is monitored. The samples are packaged with blue ice in a cooler and shipped to the laboratory. Cooler temperatures will be checked upon arrival at the laboratory.

Samples which are collected and shipped off-site during the same working day are packaged with blue ice to cool the samples as much as possible during shipment to the laboratory. Cooler temperatures will be checked upon arrival at the laboratory, but it is possible the samples will achieve temperatures of 4°C±2°C only after being placed in the receiving laboratory refrigerator.

Because temperature measurements obtained shortly after packaging a cooler for shipment are grossly inaccurate, cooler temperatures will not be monitored prior to shipment. Cooler temperatures will be checked upon arrival at the laboratory. The release of sample coolers for off-site shipment shall be in accordance with Environmental Management Radiological Guidelines 3.02 (EMRG 3.02), and Radiological Operating Instructions 3.02 (ROI 3.02), as appropriate.

4.6 PERSONAL PROTECTIVE EQUIPMENT

Personal protective equipment for sample collection is specified in the CWTF Health and Safety Plan (RF/ER-96-0118). Disposable PPE generated during sampling shall be bagged and delivered to the Health and Safety Specialists for radiological screening (refer to 5-21000-OPS-FO.06, Handling of Personal Protective Equipment as appropriate).

5.0 DATA QUALITY OBJECTIVES

As stated in EPA document Guidance for Planning for Data Collection in Support of Environmental Decision Making Using the Data Quality Objective Process, EPA QA/G-4, Interim Final , "the DQO Process is a series of planning steps based on the Scientific Method that is designed to ensure that the type, quantity, and quality of environmental data used in decision making are appropriate for the intended application." The DQO process consists of the following seven distinct steps: state the problem; identify the decision; identify inputs to the decision; define the study boundaries; develop a decision rule; specify limits on the decision error; and optimize the design for obtaining data. The following two sections discuss the OU7 PSITS DQOs and parameters which will be used to ensure data quality and useability.

5.1 DISCUSSION OF OU7 PSITS DQOs

The overall objective of the OU7 PSITS (the elimination, to the extent practicable, of the discharge of FO39-list waste to a surface water body) is accomplished through the interception and treatment of the seep water in an effort to reduce the concentrations of VOCs and SVOCs being discharged to the East Landfill Pond. The OU7 PSITS is in fact a passive treatment system, and it is the GAC drum(s) which reduce the concentration of VOCs and SVOCs in the seep water. The system will be monitored quarterly for VOC and SVOC effluent quality, and will be monitored to determine if GAC breakthrough has occurred which will then dictate GAC drum rotation/change-out (note that GAC drum rotation is only relevant if two drums are being operated in series).

GAC effluent, effluent from either the sole GAC or the lead GAC as appropriate, will be sampled monthly for the first six months to determine an approximate time frame for GAC breakthrough (note that the time to GAC breakthrough will change with variations in contaminant loading and seasonal flow rates). Breakthrough for the OU7 PSITS GAC will be defined as concentrations of VOCs in the GAC effluent which exceed the OU7 PSITS Performance Objectives (refer to Appendix A). VOCs are used as indicators because generally carbon has less absorption capacity for VOCs than SVOCs, and therefore VOCs would breakthrough more quickly. The sampling frequency used to determine an approximate breakthrough time may be adjusted as data from the first few months is evaluated. When it is determined that GAC breakthrough has occurred the GAC drum(s) will be rotated/changed-out. Table 5-1 lists carbon adsorption capacities for a few select constituents.

TABLE 5-1
CARBON ADSORPTION CAPACITIES FOR A FEW SELECT COMPOUNDS

Constituents a/	Carbon Adsorption Capacity b/ (mg/g)
VOLATILES	
1,1-Dichloroethane	1.8
1,2-Dichloroethene	3.1 (trans)
2-Butanone (MEK)	--
2-Hexanone (MBK)	--
4-Methyl-2-Pentanone	--
Acetone c/	--
Benzene	1.0
Carbon Disulfide	--
Chloroethane	0.59
Chloromethane	--
Ethylbenzene	53
Methylene chloride	1.3
o-Xylene	--
Tetrachloroethene	51
Toluene	26
Trichloroethene	28
Vinyl Acetate	--
Vinyl Chloride	--
Xylene (total)	85 (p-xylene)
SEMI-VOLATILES	
2,4-Dimethylphenol	78
2-Methylnaphthalene	--
4-Methylphenol	--
Acenapthene	190
bis(2-ethylhexyl)phthalate	11,300
Butylbenzylphthalate	1,520
Dibenzofuran	--
Diethylphthalate	110
Di-n-butylphthalate	--
Fluorene	330
Naphthalene	132
Phenanthrene	215
Phenol	21

a/ This list is comprised of the VOC and SVOC constituents found in Appendix A of the Passive Seep Interception and Treatment OU7 Modified PAM dated March 1996, and constituents identified in the 5-29-96 sample.

b/ As found in "Carbon Adsorption Isotherms for Toxic Organics", EPA-600/8/80-023, April 1980.

c/ Although the above referenced EPA document does not include a carbon adsorption capacity for acetone, it is known that acetone loads poorly on GAC.

5.2 PARRC PARAMETERS

The Precision, Accuracy, Representativeness, Completeness, and Comparability parameters (PARCC parameters) can be used as a means of ensuring and assessing the quality and useability of laboratory data. The analytical program specifies using EPA-approved methods and analytical methods referenced in the Rocky Flats General Radiochemistry and Routine Analytical Services Protocol (GRRASP, DOE, 1994) since these methods and associated QA/QC protocols are generally considered industry standards for producing accurate and precise data.

Volatile organic trip blank samples provide a measure of contamination that has been introduced into a sample set during sample collection or shipping. Seep VOC and SVOC contaminants are known based on both historical and recent samples, and the Performance Objectives listed in Appendix A of this document are based on a combination of seep characterization, a selection of the VOC and SVOC constituents as listed in the OU7 PAM, and parallel RFCA numerical standards. Because of the historical seep data and the use of the Performance Objectives volatile organic trip blank samples will be limited to one sample per year taken during a quarterly sampling event. No volatile organic trip blanks will be collected with the GAC Breakthrough Assessment samples.

Field duplicate samples (at a minimum of 1 per 20 samples) and sampling equipment rinsate blanks (at a minimum of 1 per 20 as appropriate) will be taken to ensure sample quality. A comparison between real and duplicate samples must meet a 200% Relative Percent Difference (RPD) for radiological samples, and a 30% RPD for organic samples. The RPD limits must be met for all samples with results greater than five times the reporting limit.

Precision and accuracy objectives are evaluated on the basis of the detection limits specified in the referenced analytical method and/or in data validation guidelines. For radionuclide analyses, the accuracy objectives specified in the GRRASP methods and data evaluation protocols will be followed.

Representativeness expresses the degree to which sample data accurately and precisely represent a characteristic of a population, parameter variations at a sampling point, or an environmental condition. Representativeness is a qualitative parameter that emphasizes the proper design of the sampling program.

A completeness goal 90% is expected for the PSITS; that is, for each sample taken and each analysis performed during the PSITS operation, the usable data points will be at least 90% of the theoretical amount of data points.

Comparability is a qualitative parameter that expresses the confidence with which one data set can be compared with another. To achieve comparability, work performed as part of the systems operation will follow the approved SAP, which includes the use standardized analytical protocols, data collection following 5-21000-PS-FO.13, Containerization, Preserving, Handling and Shipping of Soil and Water Samples, and report data in consistent units of measurement.

6.0 DATA MANAGEMENT

Each PSITS sample point is assigned a unique Rocky Flats Environmental Data System (RFEDS) location code, and this unique code will be utilized on the COC form, DATACAP form FO.14F (a DATACAP form specific to surface water sampling), and during input to and retrieval from the RFEDS database. The RFEDS location codes utilized at the PSITS are detailed in Section 2.0.

Field observations for pH, conductivity, and sample temperature will be determined in the field laboratory, and will be recorded on form FO.14F. Extraneous field parameters (e.g., stream width, total depth, salinity, saturation, dissolved oxygen, chlorine, total alkalinity, and eH, etc.) will not be taken. A sample chain of custody (COC) will be initiated for samples collected from the PSITS. The COC shall be maintained through all sample storage and all transfers of custody until the sample is received at the testing laboratory. Samples shall be logged in upon receipt at the analytical laboratory and sample tracking throughout the analytical process shall be maintained in accordance with laboratory procedures. 5-21000-OPS-FO.13, Containerization, Preserving, Handling, and Shipping of Soil and Water Samples and 4-B29-WR-OPS-FO.14, Field Data Management will be followed during sampling activities.

Results from the radiological screen will be sent to the Project Manager. Other results will be submitted to RFEDS to track, store, and retrieve project data. The sample collection information submitted to RFEDS will include sample number, volume collected or volume of container, sampler's name, sampling date, analysis parameter, and COC number in accordance with 4-B29-WR-OPS-FO.14, Field Data Management.

7.0 ANALYTICAL RESULTS EVALUATION

7.1 CONTROL OF NONCONFORMANCES

The requirements for the identification, control evaluation, and disposition of nonconforming samples and data will be implemented as specified in Section 15.0 of the RMRS QAPP, as applicable.

7.2 USE OF ANALYTICAL RESULTS

The treated effluent and lead GAC effluent data (as applicable) analytical data will be assessed against OU7 PSITS Performance Objectives (Appendix A) to determine when it is necessary to change-out/rotate the GAC drums.

APPENDIX A

OU7 Passive Seep Interception and Treatment System

Performance Objectives

APPENDIX A
OU7 PASSIVE SEEP INTERCEPTION AND TREATMENT SYSTEM
PERFORMANCE OBJECTIVES

Constituents	RFCA a/ Segment 4a & 4b Standards (ug/L)	RFCA a/ PQLs b/ (ug/L)
VOLATILES		
1,2-Dichloroethene	70 (cis)	5.00
Benzene	1	1.00
Chloromethane	5.7	--
Ethylbenzene	680	10.00
Methylene chloride	5	--
Tetrachloroethene	0.8	**1.00**
Toluene	1,000	5.00
Trichloroethene	2.7	1.00
Vinyl Chloride	2	2.00
Xylene (total)	10,000	5.00
SEMI-VOLATILES		
2,4-Dimethylphenol	540	50.00
Acenapthene	520	10.00
bis(2-ethylhexyl)phthalate	1.8	**6.00**
Butylbenzylphthalate	3,000	10.00
Diethylphthalate	23,000	10.00
Di-n-butylphthalate	2.7	**10.00**
Fluorene	1,300	10.00
Naphthalene	620	10.00
Phenanthrene	0.0028	**10.00**
Phenol	2,560	50.00

a/ Numerical standards listed in this table are taken from Table 1 - Surface Water Action Levels & Standards dated July 19, 1996 as found in the Rocky Flats Cleanup (RFCA) Agreement.

b/ Whenever the practical quantitation limit (PQL) for a pollutant is higher (less stringent) than a standard and/or action level, "less than" the PQL shall be used as the compliance threshold. These less stringent PQLs are bolded.